

A SURVEY ON PROBLEM FACED BY CONTRACTORS USING DESIGN &
BUILD CONTRACT

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A thesis submitted in partial fulfillment of the
Requirements for the award of the degree of
Bachelor of Civil Engineering

Faculty of Civil Engineering & Earth Resources
University Malaysia Pahang

NOVEMBER 2009

“I hereby declare that I have read this thesis through this project report and in my opinion this thesis is sufficient in terms of scope and quality in fulfillment of the requirement for the award of the degree of Bachelor of Civil Engineering”

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I declare that this thesis entitled “*A SURVEY ON PROBLEM FACED BY CONTRACTORS USING DESIGN & BUILD CONTRACT*” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature :
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Date :

“Almighty Allah, please give blessing to them...

My beloved parent Bok &Ma,

My brothers, my sisters,

My twin,

My bee,

My Lecturers,

My friends and to all Muslims...

Thanks for support....this is for us”

ACKNOWLEDGEMENT

Bismillahirrahmanirahim...first of all, I praise and glory to Allah S.W.T, God of all creation and greetings and salutations we bring forth to our Prophet Muhammad S.A.W for supervision this final year project one and constantly guiding this project towards completion.

I'm as the author of this thesis wishes and express the greatest appreciation to Mr. Zahrizan bin Zakaria as a supervisor of this final year project. Once, nobody believes the project will manage successfully, but with his dedication and guidance, the project is able to complete on time. Special thanks for his for the opportunity given and for the efforts towards the completion of the project.

I want to express my gratitude to my beloved parents and siblings for the support given and commitment although indirectly involves in this project, for their efforts to help me in the completion of this final year project.

I also would like to express my highest appreciation to those who sincerely without hesitation helped me to make this final year project especially to the UMP staff and academician, to all respondents who were willing to give good co-operation because without their help, this study would not possible without them..

Last but not least, to my entire friends, your help and support are really appreciated and will remember forever, InsyaALLAH. Thank you.

ABSTRAK

Pembinaan Reka dan Bina proses merupakan salah satu bahagian dalam industri pembinaan. Hari ini proses tersebut tumbuh dengan cepat dalam industri tersebut. Reka dan Bina berkembang dengan terkenal, kesemuanya tumbuh dengan pelbagai. Namun begitu, Reka dan Bina tidak terkecuali menghadapi masalah oleh kontraktor dalam industri pembinaan seperti konflik antara kontraktor dan pihak lain (perunding dan pemilik), perunding kurang pengalaman dan masalah komunikasi dan koordinasi oleh kontraktor dan pihak lain. Tujuan utama kajian ini adalah untuk membuat perbandingan antara kontrak reka dan bina dan kontrak mengikut kebiasaan, mengenalpasti masalah-masalah yang biasa dan faktor yang dihadapi oleh kontraktor dan menempatkan masalah biasa dan faktor antara kontraktor. Borang kajiselidik diagihkan sendiri kepada kontraktor (kelas A) berdaftar dengan Pusat Khidmat Kontraktor (PKK), kontraktor gred 7 yang mana berdaftar dengan Lembaga Pembangunan Industri Pembinaan (CIDB), syarikat bumiputera dan badan kerajaan. Maklumat yang telah dapat dari borang kajiselidik dianalisis menggunakan purata indek dan kekerapan analisis. Keputusan tinjauan menunjukkan lima kategori masalah yang dikenalpasti. Ianya adalah masalah dalam aspek umum, masalah dalam aspek rekabentuk, masalah dalam aspek kewangan, masalah dalam aspek kualiti dan masalah dalam aspek masa. Daripada analisis nilai yang paling tinggi dalam aspek umum adalah konflik antara kontraktor dan pihak lain (perunding dan pemilik). Diikuti dengan aspek kualiti ialah pertukaran pesanan bahan-bahan binaan oleh pemilik semasa pembinaan, masalah dari aspek rekabentuk ialah kesilapan dan perbezaan dalam dokumen rekabentuk, masalah dari aspek kewangan ialah harga semasa untuk projek tinggi dari harga sasaran oleh pemilik dan masalah dari aspek masa ialah kelewatan dalam kerja-kerja permulaan disebabkan oleh kekurangan masa untuk mendapatkan kelulusan yang telah ditetapkan oleh undang-undang. Berdasarkan maklumat yang diperolehi dari borang kajiselidik didapati masalah diantara kontraktor tidak kritikal kerana keseluruhan responden bersetuju dengan masalah tersebut. Akhirnya maklumat yang didapati dapat digunakan oleh badan kerajaan dan kontraktor untuk mengatasi masalah yang dihadapi oleh kontraktor menggunakan kontrak reka dan bina.

ABSTRACT

Design and build construction process has been part of the construction industry. Today, the process is growing rapidly in this industry. As it has been grown in popularity, design and build has evolved all manner of hybrids. However, Design and Build also not exclude were faced problem by contractors in the construction industry such as conflicts between contractor and other parties (consultant and owner), Inadequate experience of consultant, problems communication and coordination by contractor with other parties. The aims of the study are to study comparisons between designs & build contract and conventional contract, to identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors. The questionnaires were distributed to the contractor (Class A) registered with Pusat Khidmat Kontraktor (PKK) , grade 7 contractors which registered with construction industry development board CIDB Bumiputera companies and government agencies by hand at Klang Valley. The data from the questionnaire was analyzes in average index and frequency analysis. Result of the survey indicated, five of category problems were identified. There are problem in general aspect, problem in design aspect, problem in financial aspect, problem in quality aspect and problem in time aspect. From the analysis the highest degree of agreement in general aspects is conflicts between contractor and other parties (consultant and owner). It is followed with in quality aspects is change materials order by owner during construction, problem in design aspects is mistakes and discrepancies in design documents, problem in financial aspects is actual price for project higher than owner's target price and problem in time aspects is delays in commencing work because under-estimated time needed to obtain statutory approvals. Based on the result obtained from questionnaires were identified the problems among contractor are not critical because overall the respondents are agree with that problem. Finally, the information gathered can be used for government sector and contractor to overcome the problem faced by the contractor using design & build contract.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	TITLE	i
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGMENTS	iv
	ABSTRACT	v
	ABSTRAK	vi
	TABLE OF CONTENTS	vii
	LIST OF TABLES	xi
	LIST OF FIGURES	xii
	LIST OF ABBREVIATIONS	xiii
 1	 INTRODUCTION	
1.1	Introduction	1
1.2	Background of Study	2
1.3	Problem Statement	5
1.4	Objective	6
1.5	Scope of Study	6
1.6	Methodology	7
1.7	Significant of study	8

2 LITERATURE REVIEW

2.1	Introduction	9
2.2	Definition of contracts	10
2.3	Contract Elements	10
2.3.1	The Essence of a Contract	11
2.3.2	Basic Elements of a Contract	12
2.4	Types of contracts	13
2.4.1	Contracts based on pricing/payment criteria	14
2.4.1.1	Fixed price type of contracts	14
2.4.1.2	Cost reimbursement types of Contracts	17
2.4.2	Contracts based on method of procurement	17
2.5	Delivery Methods	21
2.5.1	Conventional / Traditional Contract	21
2.5.1.1	Role of Owner, Contractor and Design Professional under a conventional Contract	22
2.5.1.2	Advantages	23
2.5.1.3	Disadvantages	25
2.5.2	Design and Build Contract	27
2.5.2.1	Role of the parties under a Design and Build Contract	29
2.5.2.2	Advantages	33
2.5.1.3	Disadvantages	33
2.6	Contractor	35
2.7	Common Problem Faced by Contractors	35
2.8	Summary	38

3 METHODOLOGY

3.1	Introduction	39
3.2	Literature Review	40
3.3	Interview	41
3.3.1	Types of Interviews	42

3.4	Questionnaires Review	43
3.4.1	Section A: General Information of the Respondents	44
3.4.2	Section B: To identify the Common Problems And the factors faced by Contractors and to Rank the Problems And the factors among Contractors	44
3.5	Data Analysis	45
3.5.1	Frequency Analysis	46
3.5.2	Average Index	46
4	RESULT & ANALYSIS	
4.1	Introduction	48
4.2	Questionnaire Analysis	49
4.3	Section A: Analysis General Information of the Respondents	49
4.3.1	Position in Company	50
4.3.2	Company Experiences	50
4.3.3	Respondents Experience	51
4.3.4	Types of Project using Design and Build Project	52
4.3.5	Types of Design and Design Method	53
4.4	Section B: Analysis The Common Problems And the factors faced by Contractors	54
4.4.1	Problem in General Aspect	56
4.4.1	Problem in Quality Aspect	57
4.4.1	Problem in Design Aspect	59
4.4.1	Problem in Financial Aspect	60
4.4.1	Problem in Time Aspect	62
4.5	Analysis of Rank the Problems And the factors among Contractors	62
4.6	Summary	65

5	CONCLUSION & RECOMMENDATION	
5.1	Introduction	66
5.2	Conclusion	66
5.2.1	Objective 1: Study the comparisons between Design & Build Contract and Conventional Contract	67
5.2.2	Objective 2: Identify the common problems and the factors faced by contractor	67
5.2.3	Objective 3: Rank the problems and the factors among contractors	70
5.3	Recommendation	70
5.3.1	Recommendation for the study	71
5.3.2	Recommendation for further studies	71
	REFERENCES	72
	APPENDIXS	74

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1	Elements of valid/Enforceable Agreement	13
2.2	Conventional sequential Arrangements	25
4.1	Respondents by Position	50
4.2	Company's Experience in Construction Industry	51
4.3	Respondents Experience in Construction Industry	52
4.4	Types of Project using Design & Build Method	53
4.5	Types of Design & Build Method	54
4.6	Rank the Problems among Contractors	63

LIST OF TABLES

TABLE NO.	TITLE	PAGE
2.1	Definitions of Contract	27
2.2	The Problem faced by Contractor	36
3.1	The level of Agreement & Evaluation for Average Index Analysis	47
4.1	Percentages of “Respondents Rate”	49
4.2	The level of Agreement & Evaluation for Average Index Analysis	55
4.3	Problem in General Aspect	55
4.4	Problem in Quality Aspect	57
4.5	Problem in Design Aspect	59
4.6	Problem in Financial Aspect	60
4.7	Problem in Time Aspect	62
4.8	Percentages of “Rank the Problems and the factors among Contractors”	63
5.1	Categories 1: Problem in General Aspect	68
5.2	Categories 2: Problem in Quality Aspect	68
5.3	Categories 3: Problem in Design Aspect	68
5.4	Categories 4: Problem in Financial Aspect	69
5.5	Categories 5: Problem in Time Aspect	69

LIST OF ABBREVIATIONS

D & B	- Design and Build
CIDB	- Construction Development Board Malaysia
PKK	- Pusat Khidmat Kontraktor
A.I	– Average Index

CHAPTER 1

INTRODUCTION

1.1 Introduction

Construction is a process whereby designers' plans and specifications are converted into physical structures and facilities. It involves the organization and coordination of all the resources for the project labour, construction equipment, permanent and temporary materials, supplies and utilities, money, technology and methods, and time to complete the project on schedule, within budget, and according to the standards of quality and performance specified in the contract documents. The contractors and subcontractors play the key roles at this stage. There are also some considerable inputs for inspection and interpretation from the architect or engineer. Supporting roles are played by suppliers of materials and equipment, consultants, shipping organizations etc. The construction project shall be done perfectly and wisely in order to achieve the final result, quality product, confined completion period and minimum cost. But problems always exist along construction process (Abdul Rahman & Janidah, 2006).

The successful execution of construction projects and keeping them within estimated cost and prescribed schedules depend on a methodology that requires sound engineering judgments. To the dislikes of owners, contractors and consultants, however, many projects experience extensive delays and thereby exceed initial time and cost estimates (Abdalla M. Odeh & Hussien T. Battaineh, 2002).

The most important element in construction procurement is the contractor selection, particularly, hiring contractors who are performers. Contractor prequalification is essential in most construction projects, and the process has been performed by many different methods in practice. The overall objectives of contractor selection process is to reduce project risk, maximize overall value to the project owner, and build the close and long term relationships between members of the project. Occasionally, projects owners in the public sector put out to tender constructions projects of buildings, port works, roads, drainage, and waterworks as well as formation of sites. Contractors play a major role such projects, which is why contractor selection constitutes a critical decision for projects owners. The selection process should embrace investigation of contractor's potential to deliver a service of acceptable standard, on time, and within budget (Maryam Darvish, Mehrdad Yasaei & Azita Saeedi, 2008).

1.2 Background of Study

A general contractor is a group or individual that contracts with another organization or individual (the owner) for the construction or renovation of a building, road or other structure. After that, contractor also is defined as such if it is the signatory as the builder of the prime construction contract for the project. They responsible for the means and methods to be used in the construction execution of the project in accordance with the documents. Contract documents usually include the contract agreement including budget, the general and special conditions and the plans

and specification of the project that are prepared by a design professional. Then, contractor usually is responsible for the supplying of all material, labor, equipment, (engineering vehicles and tools) and services necessary for the construction of the project. To do this it is common for the general contractor to subcontract part of the work to other persons and companies that specialize in these types of work. These are called subcontractors. General contractors conducting work for government agencies are typically referred to as prime contractors. The responsibilities of a prime contractors working under a contract are essentially identical to those outlined above. In many cases, prime contractors will delegate portions of the contract work to subcontractors. A contractor is someone who enters into a binding agreement to perform a certain service or provide a certain product in exchange for valuable consideration, monetary, goods, services, even barter arrangements. In the building trades, a contractor is one who is engaged in the construction or building related services for a client. The construction site is overseen by a "Prime", General, or Specialty contractor, who may perform the work with employees, subcontractors or any combination there of (wikipedia, 2001-2006).

A professional contractor should also have an understanding of his or her limitations. The client works with an architect and financier long before the first shovel of dirt is removed by a contractor. During the bidding process, a contractor may have to work with the building's architect to discuss potential problems with a design element. If the complexities of the building's design or the potential cost overruns threaten to overwhelm a contractor's skills, he or she needs to step back and allow other contractors to win the bid. A good contractor understands that the success of the project depends on his or her ability to hire the right independent subcontractors and follow the wishes of the client (Michael Pollick, 2006).

In Malaysia, the last decade has seen most of the construction projects have been implemented using the traditional procurement method. But in recent years, as project get more complex which demand greater emphasis on management techniques and engineering skills, the traditional procurement approach was found not suitable to the current needs. Design and Build procurement method is an alternative to traditional method which is rapidly popular in Malaysia, especially in the public

sector. Design and Build acclaimed to be beneficial to all parties such as clients, architect, engineers and contractors (Gwen Flora, 1998).

Design and build method suitable for both public and private clients who want to control the stipulated overall time for the construction projects. All the operations are subject to considerable scrutiny and governed by fairly strict procedures especially in government funded development agencies. However, there are other reasons as to why the design and build system should be practiced to overcome the uncompleted projects that occur, which will lead to higher quality in the finished product, more accurate cost estimate and time efficiency. According to Khairuddin Abdul Rashid, 2002, said that traditional lump sum (old traditional practice) is the most frequently used procurement system in Malaysia. The system is sequential in nature and the main advantages of the traditional practice system include that it allows price to be fixed in advance of construction and the designer has full control of the design process. Meanwhile, traditional practice also has some disadvantages, including that it will lead to a more time taken to finish up the projects period and appears to encourage adversary between the parties.

Historically, the design and build system was first launched in the Public Works Department by the Malaysia Prime Minister in 1983. The first unit that has applied this design and builds system was by Kuala Terengganu Hospital, which was completed in 1985 as cited by Seng, Ng. W. and Aminah Md Yusof, 2006 and Akinteye, A, Fitzgerald , E, 1995 added that in design and build system, there is only single point responsibility of the contractor for both design and construction process. According to Beard, et al., 2001 argued and added that there is no difficult to generate more arguments and questions by the parties involved in design and build system.

1.3 Problem Statement

The Design and Build construction process has been part of the construction industry. Today, the process is growing rapidly in this industry. As it has been grown in popularity, Design and Build has evolved all manner of hybrids. However, many contractors are less gleeful about the benefits that might be expected. In theory, Design and Build puts the contractors in charge of the whole project. However, Design and Build also not exclude were faced problem by contractors in the construction industry. One of the common problems are delay in construction, this because of a global phenomenon and the construction industry in Malaysia is no exception (Murali Sambasivan & Yau Wen Soon, 2005). According to Nuhu Braimah & Issaka Ndekugri, 2008 said that the delays and disruption to contractor's progress are a major source of claims and disputes in the construction industry. The matters often in dispute concern the dichotomy in responsibility for delays (projects owner or his contractors) partly because of the multifarious nature of the potential sources of delays and disruption. With increased project complexity and requirements coupled with multiple parties all subject to their performance exigencies, the resolution of such claims and disputes has become a matter of the greatest difficulty. Besides that, the factor adversely affecting the cost performances of project are conflict among project participants, ignorance and lack of knowledge, presence of poor project specific attributes and non existence of cooperation, hostile socio economic and climatic condition, reluctance in timely decision , aggressive competition at tender stage and short bid preparation time (K.C. Iyer & K.N. Jha, 2005).

1.4 Objective

There are three (3) objectives to be achieved in this study, which are:-

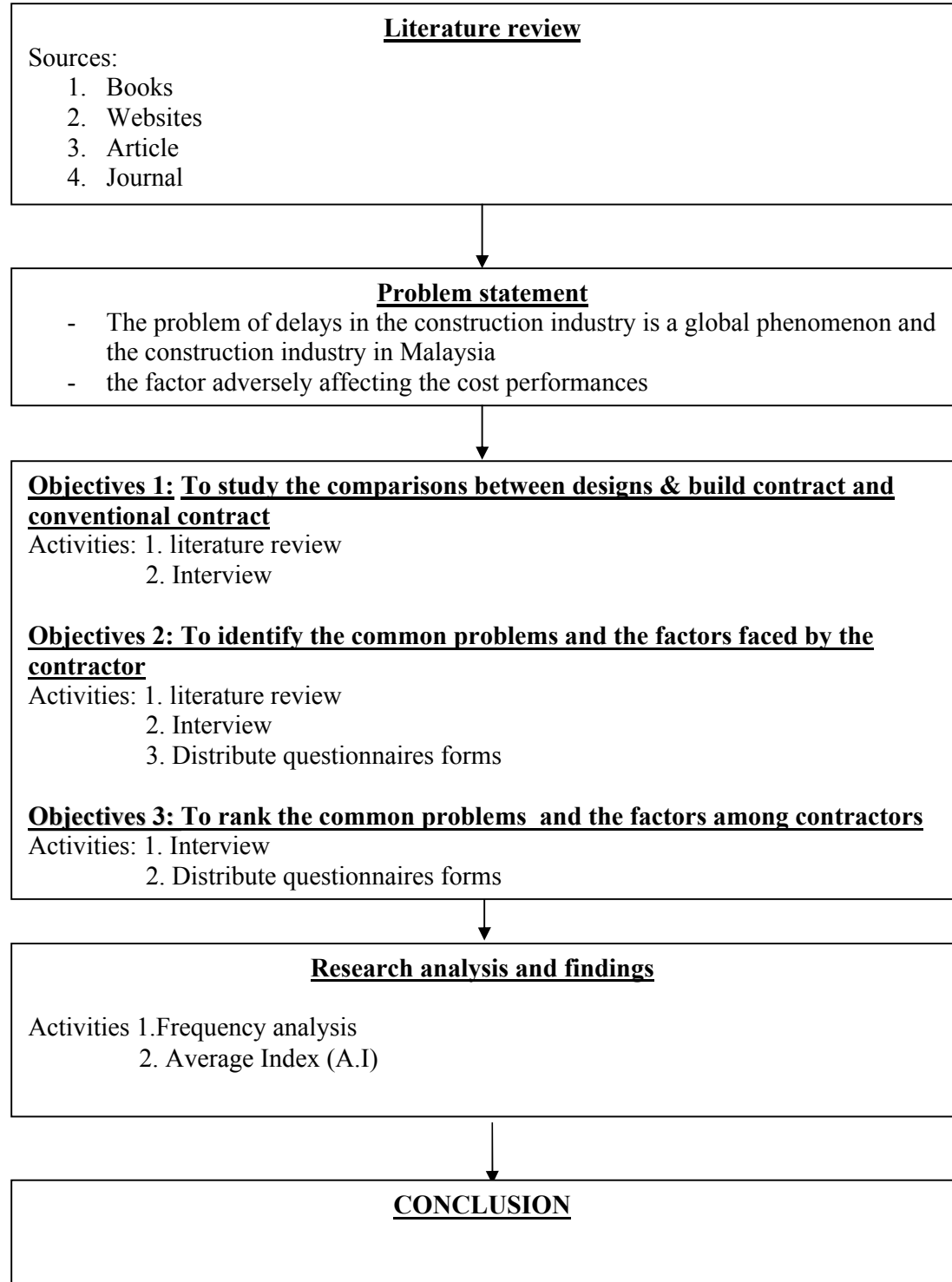
- To study the comparisons between designs & build contract and conventional contract
- To identify the common problems and the factors faced by the contractor
- To rank the common problems and the factors among contractors

1.5 Scope of Study

For the scope of this study, the limitation has been done in order to focus and narrow down the topic to the specific area and subject of study. The scopes of this case study can be stated as below:

- This study is focus about design & build contract
- This study is focusing on the contractor's Bumiputera companies
- The respondents are registered as a class A contractors with Pusat Khidmat Kontraktor (PKK)
- The respondents are the registered as grade 7 contractors with construction industry development board (CIDB)
- This study consists of government agencies
- The area of this study is in Klang Valley.

1.6 Methodology



1.7 Significant of study

The primary purpose of this final year project is to study comparisons between designs & build contract and conventional contract. Besides that, to identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors. As the research is focusing on bumiputera contractor, it is because nowadays many problem faced by the bumiputera contractor. Contractor selection is one of the main activities of clients. Without a proper and accurate method for selecting the most appropriate contractor, the performance of the project will be affected. So the most important element in construction is contractor. The information gathered can be used for government sector to overcome the problem that faced by the contractor using design & build contract.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In the previous in chapter 1, the overview of this study was explained about and the problem was identified. Then from the overview, the aims of the study are comparisons between designs & build contract and conventional contract, to identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors. Through the chapter, the elaborations of the topic are clearly described. The clarification of the sub-topic will focused about the contract, types of contract, delivery method especially in traditional /conventional contract and design & build contract, contractor and the common problems faced by contractor.

2.2 Definition of contracts

Various definitions have been proffered by different authorities for the term 'contract'. Sir William Anson, the learned English authority on the Law of Contract has defined a contract as:

“A legally binding agreement between two or more parties, by which rights are acquired by one or more to acts or forbearances on the part of the other or others”

An engineering contract dictionary defines a contract as:

“A binding agreement between two or more persons which creates mutual rights and duties and which is enforceable at law (Ir Harbans Singh KS 1, 2007)”

2.3 Contract Elements

The legally essential elements of a construction contract include an offer, an acceptance, and a consideration (payment for services to be provided). The offer is normally a bid or proposal submitted by a contractor to build a certain facility according to the plans, specification, and conditions set forth by the owner. Acceptance takes the form of a notice of award, as stated earlier. Consideration usually takes the form of cash payment, but it may legally be anything of value (S. W. Nunnally, 2007).

There are certain elements that must be present for a legally binding contract to be in place.

According to Frederick E. Gould & Nancy E. Joyce, 2003 said that the first two are the most obvious:

- An offer: an expression of willingness to contract on a specific set of terms, made by the offer or with the intention that, if the offer is accepted, he or she will be bound by a contract.
- Acceptance: an expression of absolute and unconditional agreement to all the terms set out in the offer. It can be oral or in writing. The acceptance must exactly mirror the original offer made.
- A counter-offer is not the same as an acceptance. A counter-offer extinguishes the original offer: you can't make a counter-offer and then decide to accept the original offer.
- A request for information is not a counter-offer. If you ask the offer or for information or clarification about the offer, that doesn't extinguish the offer; you're still free to accept it if you want

2.3.1 The Essence of a Contract

According to Frederick E. Gould & Nancy E. Joyce, 2003 said that the essence of a contract has been judicially expounded to the following effect:

To constitute a valid contract, there must be separate and definite thereto; to parties must be in agreement, that there is consensus ad idem; those parties must intend to create legal relations in the sense that the promises of each side are to be enforceable

simply because they are contractual promises and the promises of each party must be supported by consideration.

All contracts are built upon the basic premise of the meeting of minds, the idea of assent and agreement as to the same thing. Agreement is to be established based on objective considerations such as conduct and not inferred from the mere mental element of intent. The other ingredients, e.g. consideration, legality, etc are then added on to reinforce and supplement the basic premise to ensure that the essence of a valid contract is tenable at law.

2.3.2 Basic Elements of a Contract

According to Frederick E. Gould & Nancy E. Joyce, 2003 said that the basic elements which are necessary for the creation of a legally binding and enforceable contract are essentially as represented in figure 2.1 and listed here under:

- a clear or firm offer or proposal
- an unqualified acceptance of the offer/proposal
- intention to create legal relations: both parties must show an intention to enter into a legally binding agreement
- consideration: each party must contribute something in reciprocation of the other's promise
- certainty : the terms of an agreement must be certain or capable of being made certain
- capacity : the parties must have a legal capacity to contract
- consent : the parties must contract with free consent, i.e. consent must not be obtained by coercion, fraud , duress, misrepresentation, undue influence, etc
- legality : the contract must be formed within the boundaries of the law, e.g. its object or consideration must not be unlawful

- possibility : the contract must be capable of performance both physically and legally

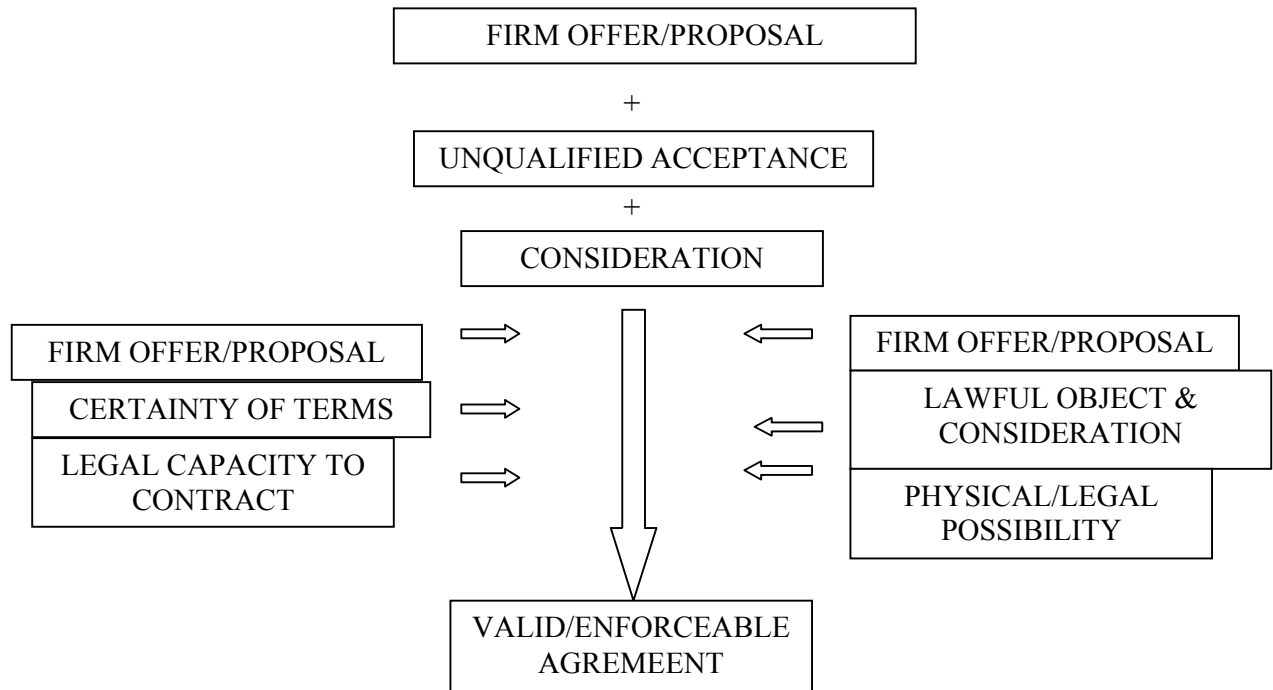


Figure 2.1: Elements of a Valid/Enforceable Agreement
(Frederick E. Gould & Nancy E. Joyce, 2003)

2.4 Types of contracts

- contracts based on the pricing/payment criteria
- contracts based on the method of contract procurement
- miscellaneous types of contracts

2.4.1 Contracts based on pricing/ payment criteria

One of the principal methods of classifying contracts is based on the method by which the contract price is established and subsequently payment is made to the contractor. Here, although there exists traditional terminology to describe the methodology adopted in specific applications, recent practices in the industry have led to the blurring of precise definitions thereby creating considerable confusion on part of the practitioners (Frederick E. Gould & Nancy E. Joyce, 2003).

According to Frederick E. Gould & Nancy E. Joyce, 2003 said that it is the intent of this chapter to look at the traditional approach whilst at the time, to address possible areas of confusion. The starting point is the further sub-classification of contracts under this category into the following types:

- a) fixed price type of contracts
- b) cost reimbursement types of contracts
- c) miscellaneous type of contracts

2.4.1.1 Fixed price type of contracts

A fixed price contract is a contract in which the contractor quotes a price for the whole of the work. In essence, the contractor takes the risk of judging how much work is involved and its cost. In practice, if the contractor is entitled to a variation in the contract sum. Then fixed price items may be defined as items paid for on the basis of a predetermined estimate of the cost of the work, an allowance for the risk involved and the market situation in relation to the contractor's workload, the estimated price being paid by the client irrespective of the cost incurred by the contractor (Frederick E. Gould & Nancy E. Joyce, 2003).

According to Frederick E. Gould & Nancy E. Joyce, 2003 said that the common species of fixed prices contracts encountered in the engineering/ construction industry include the following:

(a) lump sum contracts

Lump Sum contract where a party undertakes to complete the whole of the work for a stated and fixed amount of money payable by the other. this is so even though it may contain express stipulations permitting adjustment of the contract sum for eventualities such as variations, payment for extended preliminaries, etc. what is important is that at the time of contracting, both parties must have agreed upon a lump sum price to be payable for a defined scope/quantity of work to be undertaken. It should be noted that most of the common Standard Forms of Contract used in the country such as the JKR Forms, IEM Forms, etc are essentially entire contracts for a lump sum with modifications to ameliorate to rig ours of strict entirety. The two principal types of lump sum are with bills of quantities and with drawings and specification.

(b) Measure and value contracts

This type of contract is utilized principally where the exact scope and quality of the work cannot reasonably be determined accurately at the time of tendering. To enable the tenderers to establish a price, a basic is provided by the employer in the invitation to tender documents. Either during the currency of the contract or upon completion of the works, the works are measured, valued or payment effected to the contractor. Such contracts are common, rather than an exception in civil engineering and infrastructure projects especially those involving earthworks, work below ground level, etc. Measure and value contracts come in the two basic forms based on either a bill of approximate quantities or a schedule of prices.

(c) 'Turnkey' contracts

Going under various labels such as 'package' deal type of contracts, 'design and build/ design and construct' contracts, EPCC type of contracts, etc the defining characteristic

is the combining of all the fundamental tasks of the project, i.e. design, production (construction or building) and management in a single package. The contractor takes full responsibility and carries sole liability for design and construction.

In such typical contract, the employer approaches a contractor with a set requirements may be mere brief statements or detailed specification, drawings, schedules, etc depending on the nature and complexity of the project or the extent to which the employer has the expression of his wants.

The contractor responds to the employer with an offer called the 'contractor's proposals' which will include production as well as design work, contract price and the manner in which the contract price has been calculated, e.g. the contract price analysis, etc. bills of quantities are strictly not applicable in a 'Turnkey' contract and if something akin to these are used, they are merely for the purposes of the contract sum analysis or for making payment to the contractor.

Though 'turnkey' contracts can be on fixed price or cost reimbursement basis, the accepted practice in this country favors the fixed price approach. The norm is for the contractor to contract on the basis of a predetermined estimate of the cost of the complete work. this is in line with the selling point of such an arrangement, whereby the contractor bears all risks, inclusive of costs and pricing risks subject to adjustments occasioned by variations ordered by the employer, extended preliminaries, etc. another feature sometimes encountered in such contracts is a guaranteed maximum sum, a sum offering assurance to the employer on his maximum price exposure.

2.4.1.2 Cost reimbursement type of contracts

Cost reimbursement is a term used to describe one of the two principal methods of making payment under contract. Cost reimbursement contracts are not popular in this country as it burdens the employer with all the risk and with no advance notion of the eventual financial commitment. It general imposes no incentive on the contractor to maximize efficiency and keep the costs down since he is already assured of his fee in advance. Seemingly with this arrangement, the employer bears the brunt of this disadvantage whilst simultaneously guaranteeing the contractor of his fee with little or no attendant risks (Frederick E. Gould & Nancy E. Joyce, 2003).

The types of cost reimbursement contracts are:

- cost plus fixed fee contracts
- cost plus percentage fee contracts
- cost plus fluctuating fee contracts

2.4.2 Contracts Based On Method of Procurement

a. Traditional General Contracts (TGC)

Appearing under various labels such as general contract, 'employer-design' contracts and the like, traditional general contracts are basically characterized by the separation of the design from the manufacture (i.e. construction or installation) elements of the contract. The employer causes the design to be prepared by his professional designers and thereby takes full responsibility for the design. Depending on the contractual

arrangement selected, the employer may also cause bills of quantities to be prepared (Ir Harbans Singh KS , 2007).

Under thus methods of contract procurement, the contractor builds or manufactures what the designers have designed and/or specified. he is only responsible for the material and workmanship aspects of the contract and for the performance of his sub-contractors (inclusive of any nominated sub-contractors) not with standing its ‘time-tested’ credentials such contracts are slowly losing favor with the onslaught of increasingly complex projects preferring the newer paths of contracts procurement, e.g. ‘package’ deal type, construction management, etc (Ir Harbans Singh KS , 2007).

b. Management contracts

A management contract has bee described as a form of contractual arrangement whereby a contractor is paid a fee to manage the building of a project on behalf of a client. It is, in essence, a contract to manage rather than contracts build (Ir Harbans Singh KS , 2007).

The characteristics of a management contracts are that the employer engages the contractor design to participate in the project at an early stage contribute construction expertise to the design and manage the construction process, the latter being undertaken by a number of works (or ‘trade’) contractors. The management contractor is paid a fee, which fee may be on a fixed lump sum basic or a pre-agreed percentage. Depending on the nature of the contracts entered between the employer, the management contractor and the ‘trade’ contractors, the management contractor may or may not carry liability for the defaults and/or omissions of the latter, delay inclusive (Ir Harbans Singh KS , 2007).

c. Construction management contracts

According to Ir Harbans Singh KS, 2007 said that as aptly named, construction management contracts are a sub-set of the general corpus of management type of

contracts and such share common characteristics with management contracts discussed above. There essential differences are namely:

- the employer has direct contracts with the ‘works’/’trade’ contractors
- the employer pays such ‘works’/’trade’ contractors directly
- the construction manager is not liable for the acts and/or defaults of the ‘works’/’trade’ contractors
- The construction manager essentially acts as a mere consultant instead of a contractor in the general sense

d. ‘Package’ Deal Type of Contracts

According to Ir Harbans Singh KS, 2007 said this method of the procurement where the contractor is responsible for both design and construction (and in some cases for even financing, complete fitting out, ‘technology’ transfer, etc). The common variations include:

- Design and Build (D&B) contracts
- Design and Construct (D&C) contracts
- Engineering, Procurement and Construction (EPC) contracts
- Engineering, Procurement, Installations and Construction (EPIC) contracts
- Engineering, Procurement, Construction and Commissioning (EPC) contracts
- Selection of the contractor is normally based on competitive tendering or negotiation and payment effected on either an interim, milestone or lump sum basis.

e. Build, Operate and Transfer Contracts

According to Ir Harbans Singh KS, 2007 said that this novel method of contract procurement surfaced on the local scene directly as a result of the government’s privatization policy. Under the scheme, the contractor is responsible for:

- financing the project at all stages
- undertaking the relevant design and construction
- operating and maintaining the works over a stipulated period
- on the lapse of the agreed period, reassigning it to the employer at no further charge

f. New Types of Contracts

According to Ir Harbans Singh KS, 2007 said that with the recent building boom, the local industry experienced some 'non-traditional' Forms of Contract procurement including the so called 'Fast Tracking Contracts', Partnering Contracts' and 'Fee Contracting'

- Fast Tracking Contracts as their name aptly describes them are nothing more than contracts undertaken on a fast track basis with overlapping or concurrent stages instead of the traditional sequential of activities. The ultimate objective is to complete the project in the shortest time possible.
- Partnering Contracts are in essence an extension to the normal serial contracts. Under this system of the contract procurement, over a pre-determined or an indefinite period of time' the contractor automatically receives all new contracts from the employer with payment to be made by reference to an initially agreed formula.
- Fee Contracting were made to introduce this species of the contract locally in the late nineties, the economic 'meltdown' at the material time thwarted such efforts. Nevertheless it is one type contract that may become significant in the near future involving large and technically complex projects.

2.5 Delivery Methods

The term delivery method refers to the owner's approach to organizing the project team that will manage the entire design and construction process. This selection process is governed to a large extent by risk but also by the owner's desire to find a method that will deliver the project on time, budget, and in a form that will meet the owner's needs most effectively (Frederick E. Gould & Nancy E. Joyce, 2003).

A number of proven strategies can be used to accomplish these ends. The three most common are traditional, design/build and construction management. Combinations of these strategies may be employed well. Each has its distinct advantages and disadvantages, but the choice is not always clear and simple. The owner must carefully weigh his or her options to ensure the right choice for the specific project (Frederick E. Gould & Nancy E. Joyce, 2003).

2.5.1 Conventional/Traditional Contract

In this arrangement, the owner first hires a design professional, who then prepares a design, including complete contract documents. The design professional is typically paid a fee that is either a percentage of the estimated construction cost or a lump sum amount, or he or she is reimbursed for costs at an agreed-upon billing rate. With a complete set of documents available, the owner either conducts a competitive bid opening to obtain the lowest price from contractors to do the work or negotiates with a specific contractor. The contractor is then responsible for delivering the completed project in accordance with the dictates of the contract documents. The contractor may choose to subcontract much of the work or may have the forces in house to accomplish the task. That choice usually depends on the contractor remains solely responsible for execution of the work. This delivery mode became popular near

the turn of the twentieth century in response to the increasing specialization of the various building profession and until recently it was the predominant mode of delivery (Frederick E. Gould & Nancy E. Joyce, 2003).

During the construction process, the owner may hire the architect to administer the contract or may choose to have in-house employees do this task. Administering the contract consists of observing the work to monitor quality, carrying out the change order process, certifying payment to the contractor and ensuring that the owner is receiving the product called in the contract documents. If the owner hires the architect, he or she does so through an agency relationship that is, the architect is bound by the legal rules of this relationship and as such is empowered to act in the owner's name. The contractor, on the other hand, is hired in a simple commercial contract and as such is charged with carrying out the terms of the construction contract. There is no contract between the architect and the contractor. The relationship is once in which the architects acts for the owner during any dealings with the contractor. Nor are there contract agreements between the architect/owner and the specialty subcontractors. The relationship exists only with the contractor, who is solely responsible for the contractor performances (Frederick E. Gould & Nancy E. Joyce, 2003).

2.5.1.1 Role of Owner, Contractor and Design Professional under a Conventional Contract

Normally the outside independent architect or engineer prepares the plan and specifications for the owner prior to tendering. This means that the architect or engineer is legally responsible to the owner for design defects according to his professional services contract. Generally, the design professional has no liability for defective construction, other than for defects that should have been reasonably observed from field services & inspections which he has carried out. Most important of all, the independent architect or engineer has contractual obligations to protect the

owner. One result is that the architect or engineer frequently acts as agent for the owner during construction phase (Bryan S. Shapiro, 1994).

Under a conventional contract, the owner employs plans and specifications by way of a competitive bidding format to obtain tender bid and to select the successful contractor. This means that the owner warrants the sufficiency of the plans (full disclosure of information), and assumes any liability for defects in the plans and specifications that he provides to the contractor. Conversely, the contractor is responsible for defective construction and workmanship, but has no liability for design defects (Bryan S. Shapiro, 1994).

The typical construction contract approach leaves a big hole between the design professional and the contractor. These two parties are not linked by contract: they do not owe any contractual duties each other, although recent jurisprudence suggests that in certain circumstances, the design professional may indeed owe a legal duty in tort to a bidding contractor. Also, their bonding and insurance requirements are arranged independently. Legally, in this typical construction approach, the design professional and the contractor occupy positions that are on the “opposite side of the table” (Bryan S. Shapiro, 1994).

2.5.1.2 Advantages

The traditional method is a known quantity to owners, designers and constructors. This probably its greatest strength. For many years, the mode of delivery was the predominant one for the construction in the United States. The procedures and contractual rules of conduct have been worked out and are well understood. Many professionals prefer this well-defined relationship, which reduces their level of risk because it reduces uncertainty. Under the right circumstance, this means that a project

is more likely to proceed smoothly from beginning to end (Frederick E. Gould & Nancy E. Joyce, 2003).

The mood also contains considerable contractual protection for the owner. The allocation of risk for construction performance rests almost completely on the contractor and subcontractors. The owner is insulated from many of the risks of cost overruns, such as labor inefficiencies, nonperforming subs, inflation and other vagaries of the larger economic picture. In most instances, the owner knows the final cost at the beginning of construction, and the risks of cost overruns are borne by the contractor. However, the risk of cost increases depends to large extent on the accuracy and completeness of the contract documents. If they are unclear or not well done, the changes that must ensue can raise the owner's costs considerably (Frederick E. Gould & Nancy E. Joyce, 2003).

Additionally, the traditional method provides the owner with all the benefits of open market competition. The open bidding procedure, in which the lowest bidder is the "winners", gives the owner the lowest price available in the marketplace and presumably the greatest economic efficiency (Frederick E. Gould & Nancy E. Joyce, 2003).

Finally the owner does not have to be heavily involved in the construction process. He or she must be involved in the design process to make key decisions about whether or not to accept the design but once construction actually begins, the owner is represented by professionals empowered to act in his or her name and to make recommendations. Day to day interaction is no necessary (Frederick E. Gould & Nancy E. Joyce, 2003).

2.5.1.3 Disadvantages

Nevertheless, several elements of the traditional method can work against the owner. First, the construction professional does not enter the process until the design is complete, meaning that the design is not usually reviewed for constructability before it is finished. Design features that could have been built more economically or effectively often result in higher costs. Some design firms overcome this problem by hiring preconstruction consultants or having construction professionals on their staffs. Although this benefits the project it is not as effective as having the design reviewed by the person who will actually have to build it (Frederick E. Gould & Nancy E. Joyce, 2003).

Second, with the traditional approach it is difficult to reduce the time required to do both design and construction. As figure 2.2 shows, the process is sequential and linear; there is no opportunity to overlap tasks and thus reduce overall time. This may raise interest expenses on construction loans and other costs and can expose the project to greater risks of inflation. The time element problem is one of the primary reasons for the recent decline in the use of the traditional method (Frederick E. Gould & Nancy E. Joyce, 2003).

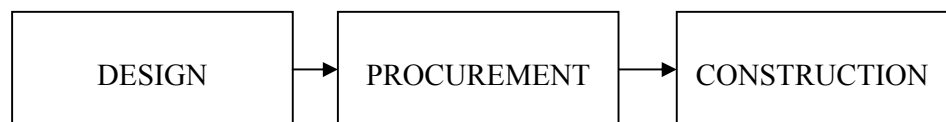


Figure 2.2 conventional sequential arrangements

(Frederick E. Gould & Nancy E. Joyce, 2003)

Finally, all parties work autonomously in this mode. The designer designs the project based on the owner's instructions. The general contractor prices and schedules the project based on the construction documents alone. This approach provides little opportunity for interaction and team building among the participants and can lead to major breakdowns relationships (Frederick E. Gould & Nancy E. Joyce, 2003).

For example, when the contract must be interpreted, the parties involved view the situation from fundamentally different perspectives. A firm fixed-price contract can considerably exacerbate the problem because the contractor had to competitively bid for the job and thus interprets details as cost-effectively as possible. The owner and the designer, on the other hand, want to receive the most for their money. Such differences in interpretation lead to conflicts that can quickly escalate, creating adversarial relationship (Frederick E. Gould & Nancy E. Joyce, 2003).

Unforeseen conditions on a job can also be a source of conflict and may lead to changes in the contract. A thorough design process and complete set of drawings attempt to minimize these conditions. Conducting additional soil borings or opening up walls in renovation work can help to properly identify actual conditions and avoid future conflicts. Unfortunately, no every condition can be identified and when unforeseen conditions or events occur the contract may have to be renegotiated. This takes away any advantage to the owner in terms of know costs when construction begins (Frederick E. Gould & Nancy E. Joyce, 2003).

2.5.2 Design & Build Contracts

Table 2.1: Definitions of Contract

AUTHOR	DEFINITION
Turner (1990) and Jansen (1991)	A Design and Build contract is one in which a single entity, usually a contractor assumes responsibility for the design in whole or in part and for the construction and completion of a construction project
Master man (1992)	The term Design and Build has almost been unanimously interpreted and defined as being an arrangement where one contracting organization takes sole responsibility, normally on a lump sum fixed price basis, for the bespoke design and construction of a client's project. This contains three main elements the responsibility for design and construction, contractor's reimbursement is generally by means of a fixed price lump sum and the project is designed and built specifically to meet the clients' needs.
David Chappell (1997)	Design and Build contracts place responsibility for both design and erection in the hands of the contractor one point of responsibility for everything. In this system contractor will carry out two functions design and construct
The Chartered Institute of Building (CIOB-1983)	Design and Build as the process where the client deals directly with the contractor for the complete building and it is the contractor who is not only responsible for but also coordinates the separate design and construction process, including engagement of the design team who are, therefore contractually linked with the contractor and not the client

The design-builds concept as originally conceived was based on the concept that a single firm had the in-house staff and expertise to perform all planning, design, and construction tasks. Later, increased interest in the concept had engineers, architect and conventional contractors seeking to compete with the original design-build firms to meet the growing interest by owners in the project delivery process (Frederick E. Gould & Nancy E. Joyce, 2003).

Under the current approach, instead of limiting design-build to firms with in house capability in both areas, the field has now been opened up to permit contracts with

engineers who subcontract the construction portion to a contracting firm, with construction contractors that subcontract design services to an engineer or architect and with engineers and architect in joint venture with contractors that subcontract design services to an engineer or architect and with engineers and architects in joint venture with contractors firms (Frederick E. Gould & Nancy E. Joyce, 2003).

There are basically three types of design-build firms today, contractor led, and designer led and single firm. Contractor-led firms tend to dominate due to their experience in estimating, purchasing. Cost control and construction supervision, not to mention the contractor's better financial backing and ability to manage risk (Frederick E. Gould & Nancy E. Joyce, 2003).

For the owner, the design and build method provides a single point of contact and responsibility throughout the life of the project. The firm hires by the owner will perform both design and construction. Entities offering this service may be design/build firms with in-house employees or joint-ventures firms that come together contractually to perform a single project. In either case, the design/build entity can hire subcontractors who perform the actual construction in the field (Frederick E. Gould & Nancy E. Joyce, 2003).

This mode is used extensively in certain industries, particularly industrial construction. The complexity of the industrial projects such as oil refineries and power plants makes them a good candidate for design/build. Before the traditional method become popular, design/build was actually the preferred mode of delivery for almost all projects, although it was not named as such. An owner hired a master builder, who designed the project, acquired the materials, and hired and supervised the craft workers on the site. This mode of delivery became less popular as professional tasks became more specialized (Frederick E. Gould & Nancy E. Joyce, 2003).

In general, it can be summarized that Design and Build provides single point responsibility for the whole design and construction. Contractors, who are responsible for the implementation of the project, have power to control all over the projects. This nonetheless does not deter the involvement of the client. The client's need and

requirements are always been taken into consideration, which this consequently presents uniqueness of the system (Frederick E. Gould & Nancy E. Joyce, 2003).

2.5.2.1 Role of the Parties under a Design/Build Contract

The first major change that one observes in a design/build contractual arrangement is that the owner signs a single agreement with the contractor. Under this agreement, the contractor agrees to provide both design and construction work, usually for lump sum fee. This means that the design professional is either employed by the contractor, or is working with the contractor in a joint venture style arrangement (Bryan S. Shapiro, 1994).

Second, the owner initiates the design/build process by laying out its own functional or performance requirements. The owner's requirements are usually sent to contractors by way of a Request for Proposals (RFP), and the responses are then evaluated to select the successful contractor, based upon various criteria, including but not restricted to price and design innovation. Under a design/build contract, the contractor's primary legal obligation is to satisfy the owner's broad performance specifications. The contractor is not building the facility or project to rigid specifications or to plans prepared by a design professional. This approach means that the contractor is responsible for both faulty workmanship in construction and for defects or deficiencies in design (Bryan S. Shapiro, 1994).

With a design/build approach, the outside independent architect or engineer no longer is employed by the owner. Therefore, owners that don't have the internal expertise relative to their project's design and construction may have to engage an additional independent advisor. The advisor's role would be to offer advice to the owner on design adequacy, to inspect critical parts of construction, to ascertain that construction

generally complies with the projects design and to prepare evaluations used for interim payment purposes (Bryan S. Shapiro, 1994).

(a) The Role of the Employer

The difficulty with the preparation of the employer's requirements does not end at preparation stage. Many employers do not realise that the employer's requirements only amount to a schematic design of the end product. In traditional form contracts, the supervising consultant would also prepare the detailed design before issuing relevant instructions to the contractor. The concept behind design and build a contract assumes that the contractor takes care of the detailed design and is conferred a relatively wide mandate when interpreting the employer's requirements (Tan, Daniel, 1997).

Employers new to the design and build concept seem to find this mandate difficult to accept when they realise that they do not have the exclusive say or a free hand in deciding the implementation or outcome of the end product. There is an unfortunate tendency for employers new to the concept to issue through their representatives numerous instructions without realising the full implications of such instructions. (Tan, Daniel, 1997).

Prudent design and build contractors will often ensure that their contractual rights are protected by notifying of claims for delay, time related damages and actual costs for having to implement such instructions that are tantamount to variation instructions (Tan, Daniel, 1997).

Disputes as to whether an instruction constitutes a variation often revolve around the employer's requirements. Has there been non-compliance of the requirements or otherwise? It would appear that the new employers that wish to have more say in the end product would have more detailed employer's requirements prepared. Inevitably higher costs to the employer will result in preparation of Employer's requirements which defeats one of the benefits of adopting a design and build contract in the first place (Tan, Daniel, 1997).

Some employers when providing too much detail may realise that they are doing what their contractor is being paid to do. Some may not realise that they may also be prejudicing their contractual position by assuming responsibility for parts of the design, particularly so if a detailed design is imposed on their contractor. Sure, virtually all design and build contracts place "full" responsibility for design on the contractor. It is submitted however that such provisions only operate if "full" design is undertaken by them; otherwise the employer will be liable for the detailed design (Tan, Daniel, 1997).

(b) The Role of the Contractor

The major difference for a contractor in a design and build contract is that it assumes liability for design. It is incumbent on the contractor to engage a design team to come up with a design that complies with the employer's requirements (Tan, Daniel, 1997).

For the inexperienced design and build contractor the selection of designers for the design team is vital. Not only should the contractor select team members that know how to integrate their portion of works into the overall design intended by the contractor, it is imperative that each team member knows how to receive instructions from the contractor (Tan, Daniel, 1997).

It may sound surprising but a vast number of consultants in Malaysia are not accustomed to receiving instructions from a contractor. Irrespective of the terms and conditions of the contract at hand, some consultants either consciously or sub-consciously attach more weight to the requirements of employers rather than contractors. These consultants appear to be entrenched in the traditional form arrangements and are inflexible, so it seems when taking instructions from contractors. The "employer vs. contractor" and siding of the former stereotype should be broken to cater for services that are now rendered to the "opposing" party (Tan, Daniel, 1997).

As it is the role of the contractor to form the design team, the selection process for design consultants must be exercised with great care to ensure that they are able and willing to receive instructions from a contractor (Tan, Daniel, 1997).

(c)Novation of Consultants

The concept of novation of consultants is usually only attributed to negotiated contracts as opposed to those for an open tender (Tan, Daniel, 1997).

The contractor's problem with consultants' inflexibility in receiving instructions is sometimes amplified when there is a requirement for a novation of the design team from the employer to the contractor. The designers who originally prepared the employer's requirements in schematic form now have to prepare the contractor's detailed design. The progression may seem natural for the designers, but different problems are posed not only to the contractor but also the employer (Tan, Daniel, 1997).

For the employer, there may be a need to re-engage an auditing team of consultants or at least one consultant to assume the role as the employer's agent or representative to administer the contract for purposes of certification and issuance of instructions. The employer could also lose the benefit of the contractor's independent design and expertise as the contractor would eventually be constructing a project based on the same source as the employer's original design team that prepared the employer's requirements (Tan, Daniel, 1997).

The contractor's main worry when consultants are novated is the allowable time before actual commencement of work at site. The typical employer who has already completed preparation of all its own documentation would only be too eager to have the contractor commence physical work on site soonest possible. Contractors have to be wary to ensure that there is sufficient time not only for the design team to prepare the detailed design prior to commencement of physical work on site, but there must also be sufficient time to enable the formalities of the novation exercise itself to be finalised (Tan, Daniel, 1997).

The hasty employer or contractor is likely to end up in disputes relating to division or apportionment of design responsibility, the relationship between the consultants, professional indemnity or responsibility of design team in obtaining approvals from relevant authorities (Tan, Daniel, 1997).

2.5.2.2 Advantages

One major reason for choosing a design/build arrangement is to benefit from the good communication that can occur between the design team and the construction team. Many of the largest design/build companies specialize in particular areas and have developed a smooth flow between design and construction phases of the project. This collaboration allows the project to be easily fast tracked, cutting down on overall schedule for the project (Frederick E. Gould & Nancy E. Joyce, 2003).

Good communication between the designer and the construction professionals also allows construction input early in the design phase. Such input includes constructability analyses, value engineering and subcontractor pricing. Cost estimating, scheduling, long lead item identification, and ordering all become part of the overall project planning (Frederick E. Gould & Nancy E. Joyce, 2003).

In general, this arrangement allows easier incorporation of changes due to scope or unforeseen conditions since their coordination occurs within the same contractual entity. The owner is less heavily involved and sits outside the direct day-to-day communication between designer and constructor. This keeps owner staffing to a minimum and puts the full responsibility for good communication, problem solving, and project delivery on the design/build team (Frederick E. Gould & Nancy E. Joyce, 2003).

2.5.2.3 Disadvantages

Although it is possible to give the owner a fixed, firm price before the project begins, this generally does not happen in a design/build arrangement. Because the firm is hired before the design has started, any real pricing is not possible. Instead, an

owner usually enters this arrangement with a conceptual budget but without the guarantee of a firm price. Firming up the price too soon puts the design/build team in the position of making the scope fit the price, which carries the risk of sacrificing quality to protect profit. If the project is fast-tracked, the owner may not have a good idea about the final price until part of the project, such as the foundation is complete (Frederick E. Gould & Nancy E. Joyce, 2003).

The owner's ability to remain marginally involved can be both an advantage and disadvantage. When design/build Company has an organization that is efficient at performing the work, the project can move very fast. If the owner does not stay consistently involved throughout the process, he or she may have to make decision without fully understanding the issues. Once a project develops a rhythm, it is difficult to change that rhythm. If the owner is not moving to the same rhythm, the project may take a direction that he or she does not want but is not aware of until too late (Frederick E. Gould & Nancy E. Joyce, 2003).

Another disadvantage is the lack of checks and balances. In the traditional arrangement, the designer prepares a complete set of contract documents, which is then used to measure and evaluate the performance of the contractor in the field. The owner often hires the designer to oversee the work of the contractor and to ensure that deficient work is identified and corrected. But in the design/build arrangement the designer works for the same company as the builder. Similarly, during construction the builder sometimes uncovers certain design deficiencies, errors or omissions. The designer is contract bound by contract to correct these deficiencies without additional costs to the owner. In design/build the design and construction professionals are put in position of critiquing their co-workers and perhaps affecting their bottom line by that critique. The owner must rely more heavily on the quality and ethics of the firm since most of the checks and balances will likely take place behind the company's door (Frederick E. Gould & Nancy E. Joyce, 2003).

2.6 Contractor

A contractor is someone who enters into a binding agreement to perform a certain service or provide a certain product in exchange for valuable consideration, monetary, goods, services, even barter arrangements. In the building trades, a contractor is one who is engaged in the construction or building related services for a client. The construction site is overseen by a "Prime", General, or Specialty contractor, who may perform the work with employees, subcontractors or any combination (Wikipedia, 2001-2006).

2.7 Common problem faced by contractor

Some of the problems unfortunately only surface after commencement of a project and if not expected, can pose real problems to unsuspecting employers and contractors. A few of the several potential problems are mentioned below (Tan, Daniel, 1997).

The unsuspecting employer may find that he still has to engage his own consultants for technical guidance and preparation of material setting out the employer's requirements. The unsuspecting contractor may find that his costs and effort for tendering would be quite high especially if he is unsuccessful in the tender exercise. Also, a contractor's perception of liability assumed for design could be much wider than anticipated (Tan, Daniel, 1997).

Table 2.2: The problem faced by contractor

No.	Author	Problem
1.	(Murali Sambasivan & Yau Wen Soon, 2005)	The problem of delays in the construction industry is a global phenomenon and the construction industry in Malaysia is no exception
2.	(Nuhu Braimah & Issaka Ndekugri, 2008)	Delays and disruption to contractor's progress are a major source of claims and disputes in the construction industry. The matters often in dispute concern the dichotomy in responsibility for delays (projects owner or his contractors) partly because of the multifarious nature of the potential sources of delays and disruption. With increased project complexity and requirements coupled with multiple parties all subject to their performance exigencies, the resolution of such claims and disputes has become a matter of the greatest difficulty
3.	(K.C. Iyer & K.N. Jha, 2005)	The factor adversely affecting the cost performances of project are conflict among project participants, ignorance and lack of knowledge, presence of poor project specific attributes and non existence of cooperation, hostile socio economic and climatic condition, reluctance in timely decision , aggressive competition at tender stage and short bid preparation time
4.	(M.S. Mohd Danuri, M.E. Che Munaaim, H. Abdul Rahman & M. Hanid, 2006)	Late and non-payment will cause severe cash flow problems especially to contractors.
5.	(Abdul Rahman Ayub & Janidah Eman, 2006)	Some common types of problem faced by bumiputera contractors in Malaysia construction industry are shown as follows:

		i. Lack of expertise and experiences ii. Over-optimistic estimation in tender bids iv. Material price escalation v. Financial Problems vi. Materials supply networking vii. Lack of skilled workers viii. Lack of construction materials and machineries ix. Inefficient and ineffective planning and management x. Communication problems
6.	(Abdul Rahman Ayub & Janidah Eman, 2006)	Delays or late deliveries, sub-standard workmanship and materials, poor safety management on sites and cost over-run of government's projects are some the issues that been seriously discussed by the government
7.	(Abdul Rahman Ayub & Janidah Eman, 2006)	Failures to perform to the quality expectations
8.	(Mansfeild NR, Ugwu OO & Doran T, 1994)	Delays causes are financing of and payment for completed works, poor contract management, changes in site condition and shortages in materials
9.	(Odeyinka HA & Yusif A, 1997)	Delay via project participants and extraneous factors
10.	(Wellington Didibhuku Thwala & Mpendulo Mvubu, 2008)	<ul style="list-style-type: none"> • financial constraints • Late payment by clients • relationships between emerging contractors and suppliers • difficulties when running a business

2.8 Summary

In this chapter, the definitions of the Design & Build contract were discussed. It can be conclude that Design & Build contracts place responsibility for both design and erection in the hands of the contractor one point of responsibility for everything. In this system contractor will carry out two functions design and construct. This thesis is more to study the common problems faced by the contractor. The following are just a few problems faced by the contractor:

- a) Lack of expertise and experiences
- b) Over-optimistic estimation in tender bids
- c) Material price escalation
- d) Financial Problems
- e) Materials supply networking
- f) Lack of skilled workers
- g) Lack of construction materials and machineries
- h) Inefficient and ineffective planning and management
- i) Communication problems
- j) Delays
- k) cost
- l) Late and non-payment

CHAPTER 3

METHODOLOGY

3.1 Introduction

The research design, instrumentation method and statistical method for analysis would be discussed clearly in this chapter with more elaboration and explanation. Other than that, the sample of the study is also focused on the through this chapter followed by the statistical method for analysis. This chapter is important as it described the methodology which is designed in achieving the research objective that to study the comparisons between designs & build contract and conventional contract, to identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors. In general, this study was used distributing the questionnaires and interview by the respondent from the contractor class A companies are registered with Pusat Khidmat Kontraktor (PKK), grade 7 contactors which registered with construction industry development board (CIDB), government agencies and construction Bumiputera companies at Klang Valley.

3.2 Literature Review

The literature reviews is doing by reading of the related books, journals, thesis, magazine, newspaper and the other resources which can be obtained from the internet, pamphlet, and browser. Most of the sources of the literature review can be found in the library.

This research was conducted by distributing a set of the questionnaire to the persons in the construction industry contractor class A companies are registered with Pusat Khidmat Kontraktor (PKK), grade 7 contactors which registered with construction industry development board (CIDB), government agencies and construction Bumiputera companies at Klang Valley.

The advantage of using questionnaire form are the data information required can be obtained directly from questionnaire and require little time duration to answer questionnaire form in more convenient to the respondent due to limited time they have and a lot of work to do. This is because all require answers needed need to be organized in the form and the respondent just need to tick the appropriate answer. Therefore the questionnaire survey is the most effective method to be applied in order to obtain the data collection.

Before examining the method used in this study, it is important to observe and to know the background of the study. This is in order to know about comparisons between designs & build contract and conventional contract, to identify the common problems faced by the contractor and to rank the problems among contractors to achieve the objectives. According to Burgess, 2001 said that the selection of suitable question is important because it is a key aspect that needs to be addressed. Within empirical research, two types of method which are interview and questionnaires survey.

3.3 Interview

Interview is one of the most popular and simple method to achieve the objective of this study. The "instrument" can be affected by factors like fatigue, personality, and knowledge, as well as levels of skill, training, and experience. (Q,Patton,1987) points out that any face-to-face interview is also an observation. The skilled interviewer is sensitive to nonverbal messages, effects of the setting on the interview, and nuances of the relationship. While these subjective factors are sometimes considered threats to validity, they can also be strengths because the skilled interviewer can use flexibility and insight to ensure an in-depth, detailed understanding of the participant's experience. The interviewer can pursue in-depth information around a topic. Interviews may be useful as follow-up to certain respondents to questionnaires, e.g., to further investigate their responses. Usually open-ended questions are asked during interviews.

3.3.1 Type of Interviews:

1. Informal, conversational interview - no predetermined questions are asked, in order to remain as open and adaptable as possible to the interviewee's nature and priorities; during the interview, the interviewer "goes with the flow".
2. General interview guide approach - the guide approach is intended to ensure that the same general areas of information are collected from each interviewee this provides more focus than the conversational approach, but still allows a degree of freedom and adaptability in getting information from the interviewee
3. Standardized, open-ended interview - here, the same open-ended questions are asked to all interviewees (an open-ended question is where respondents are free to choose how to answer the question, i.e., they don't select "yes" or "no" or provide a numeric rating, etc.), this approach facilitates faster interviews that can be more easily analyzed and compared.
4. Closed, fixed-response interview - where all interviewees are asked the same questions and asked to choose answers from among the same set of alternatives. This format is useful for those not practiced in interviewing.

(Carter McNamara, 1997-2008)

The Standardized, allowed open-ended questions respondents to record down their answers to the questions. In this method, the open-ended questions to achieve the objective of this study.

3.4 Questionnaires Review

Questionnaire survey is one of the most popular and simplest methods in order to achieve the objectives of this study. Questionnaire is defined as a formal set of question or statement designed together the information from respondents that will accomplish the goals of the research project (Redzuan, 2006). The questionnaire designed need to meet the objective and aim of the study. The design decisions depend on the purposes of the study, the nature of the problem, and the alternatives appropriate for its investigation (Isaac, 1971). A design is a strategy for constructing the research structure using concise notation that summarize a complex design structure efficiently, to show all of the major parts of the research project the background problems theoretical frameworks, hypothesis, research questions, methodology-work together to try to address the center research objective (King et al., 1994). Three fundamental considered before design the question:

- What is the purpose of the survey?
- What kind of question the survey developed to answer?
- What sorts of results consider from the questionnaires?

Two type of question that used in the questionnaire survey, open-ended and close-ended. Open-ended question do not provide respond choice and sensitive to the respondents desire for expression. The close-ended sub divided to dichotomous and multiple choices question. The close-ended questions supply response choices and reduce in interpreter bias and easy to analysis. Dichotomous question are close-ended question that offer to response choices and suitable to understand the respondents demographic compassion (Redzuan, 2006).

This method was used closed ended questions with scaled question method. Collection data of the study topic is doing by referred to the distribution of the questionnaire form to the targeted person at the Bumiputera contractor's. There are 100 sets of the questionnaire form were distributed for this study.

The questionnaire form has been produce by use the *Likert Scale* to ease the person to answer the questionnaire. The questionnaire forms are creating in a structure form and have divided into 2 parts.

3.4.1 Section A: General Information of the Respondent

Section A is to obtain the information on the background of the respondents. The questionnaire includes the following:

- The position of the respondent in the company.
- The experience of the respondent in construction project.
- The experience of the company in construction industry.
- The types of project using Design & Build Method
- The types of Design & Build Method

3.4.2 Section B: To identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors

This section is focus to identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors. The respondents were asked to rank the common problem based on frequency by using to their own judgment and working experience. The sampling frame is obtained from the directory of Pusat Khidmat Kontraktor Malaysia, (PKK) and the Construction Industry Development Board Malaysia (CIDB) directory (2005-2006). The directory

contains the list of Bumiputera contractors in Klang Valley. The questionnaire is mainly based on Likert's scale of five (5) ordinal measures from one (1) to five (5) according to level of frequent. Each scale represents the following rating ordinal measures from one (1) to five (5) according to level of frequent.

(5) = Strongly Agree

(4) = Agree

(3) = *Neutral*

(2) = Less Agree

(1) = Not Agree

3.5 Data Analysis

Data analysis step is very important to give the result of the study. By this analysis also, the conclusion of the project can be made to determine either the objective of thesis is achieved or not.

In this study analysis, all the result data from table are analyzed using frequency analysis and average index. The discussions were mainly to evaluate the results obtained from the survey and rank the factors. The summary of the study then presented with the conclusion of the study, recommendation from the conclusion along with the recommendation for further studies in this area.

3.5.1 Frequency Analysis

The frequency analysis used to represent results of data analysis of the number of response that the respondent gives to different variables in the questionnaire. The result tabulated in the form of frequency number and percentage according to the total respondents. For graphic result presentation, pie chart and bar graph is used as summary.

3.5.2 Average Index

In average index analysis, the results further summarized to obtain the level of problem among the contractor. The questionnaires are based on five-point scale starting with 5 for strongly agree to 1 for not agree. The average index analysis for each variable can calculate by using formula by (AlHammad,A.Mohsen and Assaf S, 1996) as below:

$$\text{Average index (A.I)} = \frac{\sum a_i x_i}{\sum x_i}$$

Where,

a_i = constant expressing the weight given to i

x_i = variable expressing the frequency of response for $i = 1, 2, 3, 4, 5, \dots, n$

$i = 1, 2, 3, 4, 5$ similar to explanation below

x_1 = respondent frequent for “*Not Agree*” for $a_1 = 1$

x_2 = respondent frequent for “*agree*” for $a_2 = 2$

x_3 = respondent frequent for “*Neutral*” for $a_3 = 3$

x_4 = respondent frequent for “*Agree*” for $a_4 = 4$

x_5 = respondent frequent for “*Strongly Agree*” for $a_5 = 5$

The overall level of agreement by the respondents to the factors which influences the problems faced by the contractor is summarized based on the classification of the rating scale which has been modified (Abd Majid & Ronald Mc Caffer, 1997). The classifications of the rating scale are as shown in table 3.

Table 3.1: The level of agreement and evaluation for average index analysis

(Abd. Majid M.Z. and Ronald Mc Caffer, 1997)

Average index	Level of agreement of evaluation
$1.0 \leq \text{Average index} < 1.5$	Not Agree
$1.5 \leq \text{Average index} < 2.5$	Less Agree
$2.5 \leq \text{Average index} < 3.5$	Neutral
$3.5 \leq \text{Average index} < 4.5$	Agree
$4.5 \leq \text{Average index} \leq 5.0$	Strongly Agree

CHAPTER 4

RESULTS & ANALYSIS

4.1 Introduction

This chapters discussed on the analysis of the results from the return questionnaire form which were distributed to the contractor, owner, consultant and government at Klang Valley on study the comparisons between designs & build contract and conventional contract, to identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors. All the data from the questionnaires were analyzed by using average index analysis and frequency analysis.

4.2 Questionnaire Analysis

In the previous in chapter 3, the questionnaire forms are divided into three sections. For the first section are Questionnaire cover and general information and instructions to the respondents. In section A, the Respondent's Background and in section B, the questionnaire.

The questionnaire were distributed to the respondent about 80 questionnaire paper but were received only in 62 papers. The responses rate is summarized in the table 4.1.

Table 4.1: Percentages of “Respondents rate”

No of sent out :	80 Questionnaires
No of returned :	62 Questionnaires
Respondents rate :	77.5 %

4.3 Section A- Analysis for General Information of the Respondent

In section A, of the study questionnaire is about position in company, company experience, respondent's experience, types of project using Design & Build Method and Types of Design & Build Method.

4.3.1 Position in company

Position in company of the is classified to four categories as shown in Figure 4.1

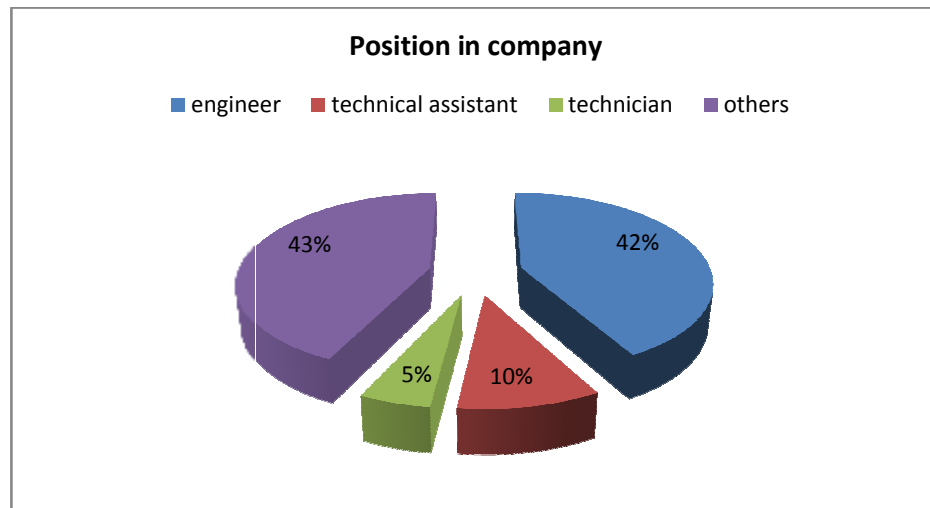


Figure 4.1: Respondents by position

From figure 4.1 illustrates the composition of respondents by profession. From the total 62 responses received, 26 responses (42%) received from engineer, 6 responses (10%) received from technical assistant, 3 responses (5%) received from technician and 27 responses (43%) received from others such as quantity surveyor.

4.3.2 Company experiences

Number of year the organization/company has experience in construction of the respondents is classified to four categories as shown in Figure 4.2.

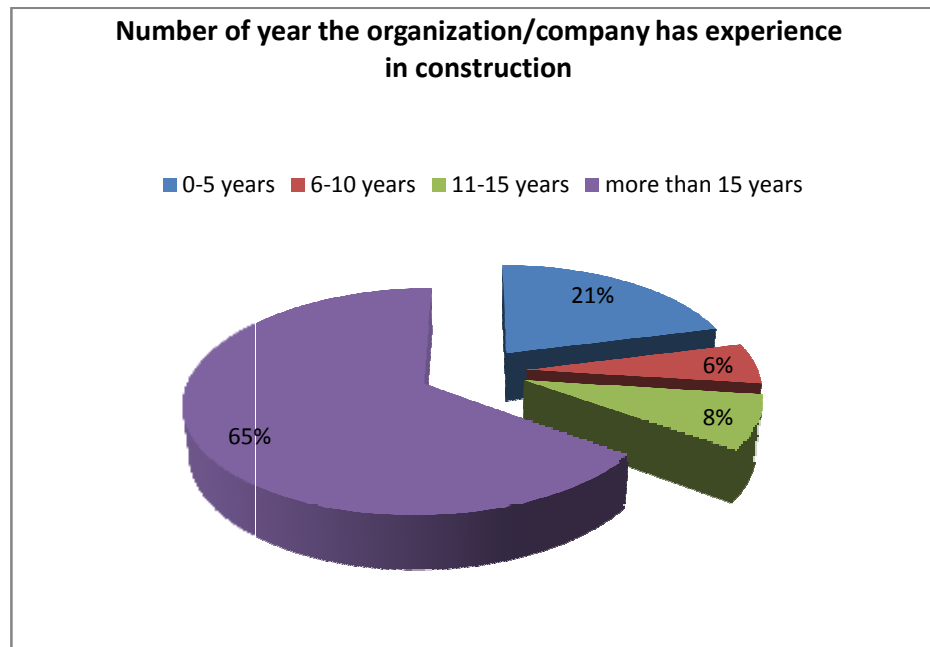


Figure 4.2: Company's experiences in construction industry

From figure 4.2 it shows that 13 companies (21%) have experiences less than 0– 5 years, 4 companies (6%) , 5 companies (8%) have experiences at least 11 - 15 years and finally 40 companies (65%) have experiences in construction industry more than 15 years.

4.3.3 Respondent Experiences

Number of working in the construction industry of the respondents is classified to four categories as shown in Figure 4.3.

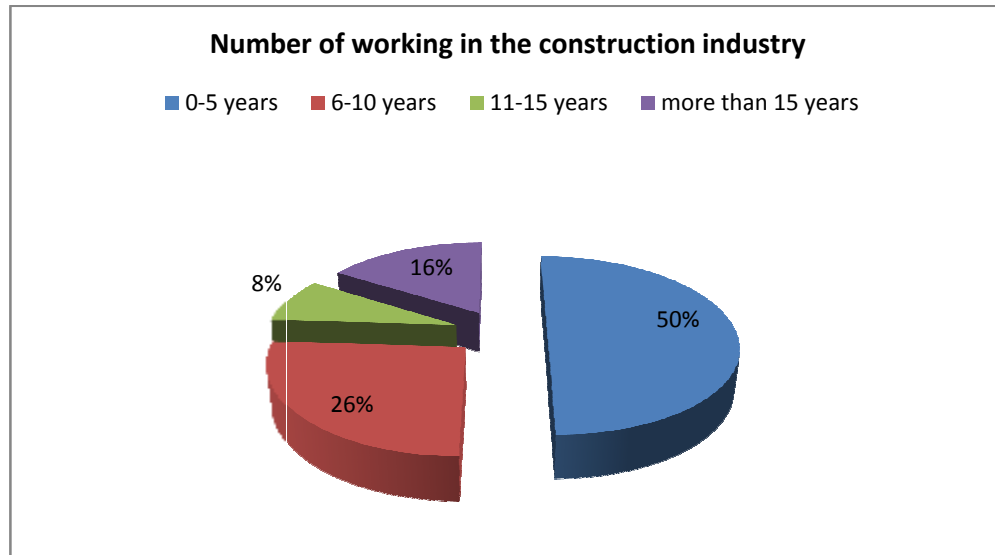


Figure 4.3: Respondent experiences in construction industry

From figure 4.3, you can see that the respondent under 0 – 5 years only 50% of the respondents (31 responses), for 6 – 10 years there are 26% of the respondents (16 responses), for 11-15 years there are 8% of the respondents (6 responses) and more than 15 years are 16% of respondents (10 responses) which is answered the questionnaire form have working experiences in construction industry. They had qualifications ranging of certificate and diploma from polytechnics until had bachelor of university where there are field in engineering

4.3.4 Types of Project using Design & Build Method

Respondents have involved in various type of Project using Design & Build method such as education project, health project, civil engineering project and commercial project. The result is shown below in figure 4.4.

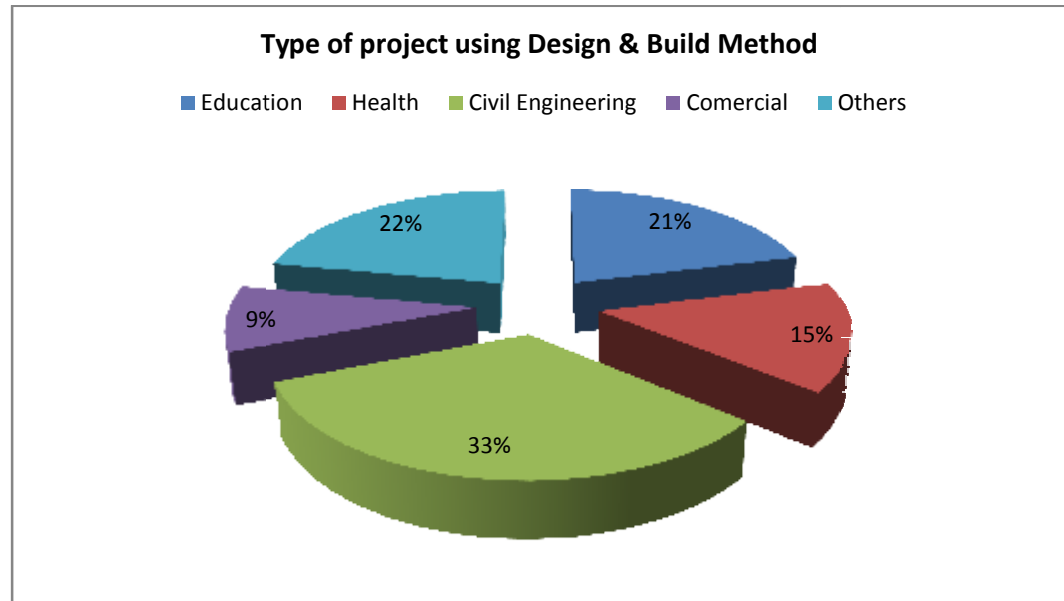


Figure 4.4 Types of Project using Design & Build Method

From figure 4.4 shows that 19 responses (21%) have experiences involved in for education project, 14 responses (15%) have involved in health project, 31 responses (33%) have involved in civil engineering project, 8 responses (9%) have involved in commercial project and 20 responses (22%) have involved in others project. Major of the respondents involved the civil projects such as design structures.

4.3.5 Types of Design & Build Method

Many types of Design & Build Method are using in the construction such as traditional design and build, develop and construct, turnkey, design, construct and manage, and design and manage. The result is shown below in figure 4.5.

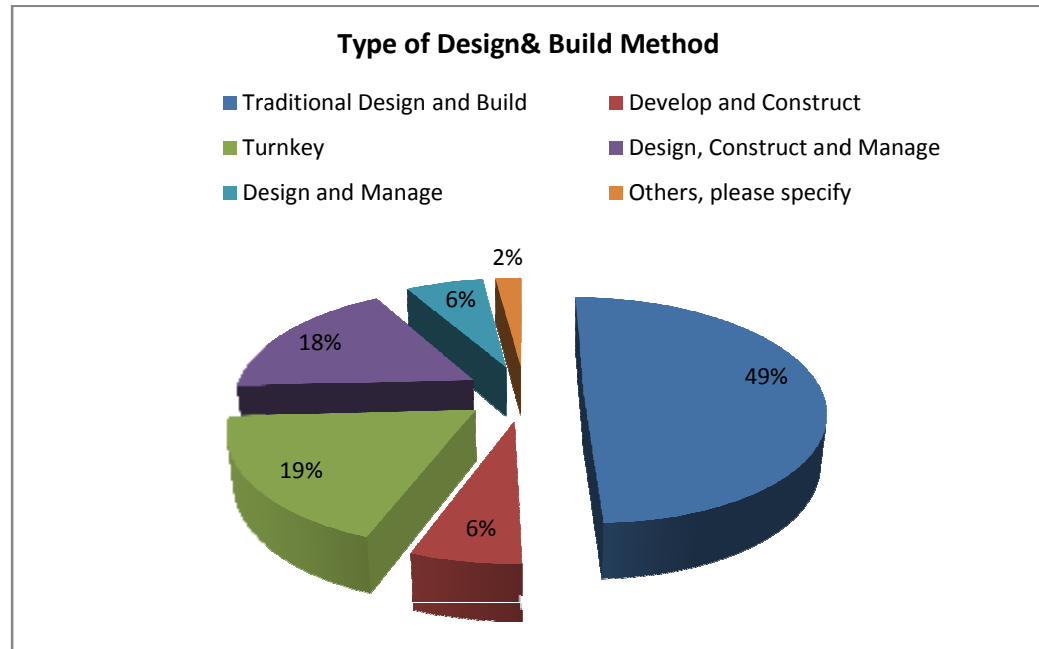


Figure 4.5 Types of Design & Build Method

From figure 4.5 shows that 40 responses (49%) have experiences involved in Traditional Design and Build method, 5 responses (6%) have involved in Develop and Construct method, 15 responses (18%) have involved in Turnkey method, 14 responses (17%) have involved in Design, Construct and Manage method, 5 responses (6%) have involved in Design and Manage, 2 responses (2%) have involved in others method.

4.4 Section B-Analysis the common problems and the factors faced by the contractor

For this question, the five of the problems was identified. There are: Problem in General Aspect, Problem in Quality Aspect, Problems in Design Aspect, Problems in Financial Aspect and Problems in Time Aspect. Analysis of the returned questionnaire was analyzed as below using classification of the rating scale which has

been modified (Abd Majid & Ronald Mc Caffer, 1997). The classifications of the rating scale are as shown in table 4.2.

Table 4.2: The level of agreement and evaluation for average index analysis
(Abd. Majid M.Z. and Ronald Mc Caffer, 1997)

Average index	Level of agreement of evaluation
$1.0 \leq \text{Average index} < 1.5$	Not Agree
$1.5 \leq \text{Average index} < 2.5$	Less Agree
$2.5 \leq \text{Average index} < 3.5$	Neutral
$3.5 \leq \text{Average index} < 4.5$	Agree
$4.5 \leq \text{Average index} \leq 5.0$	Strongly Agree

4.4.1 Problem in General Aspect

There are five major problems that contributed to the causes of the problem in General Aspect that shows the results of the average index at Table 4.3.

Table 4.3: Problem in General Aspect

1 = Not Agree 2 = Less Agree 3 = Neutral 4 = Agree 5 = Strongly Agree

Categories 1: Problem in General Aspect								
No	Problems	1	2	3	4	5	average index	Rank
1	Conflicts between contractor and other parties (consultant and owner)	1	7	15	30	9	3.63	1
2	Problems communication and coordination by contractor with other parties		8	20	27	7	3.53	2
3	Inadequate experience of consultant	6	11	17	22	6	3.18	5
4	Lack of staff and labors	4	11	19	19	9	3.29	4
5	Changed conditions/differing site conditions	1	8	24	22	7	3.42	3

From table 4.3, the results show that the highest degree of agreement in general aspects is conflicts between contractor and other parties (consultant and owner). It indicated the range in 3.63 of the average index. The range index shows the respondents agree with that problem. The research from Oberlender, 1993 said that contractors are independent business organization and are awarded the projects to produce the required end product as stipulated in the contract documents. In the case of the owner and the contractor may disagree on certain things, the achievement of the end product must always be the top priority of both parties This is happen because contractor and other parties have a different opinion about their project. A good

relationship between owner and the project contractor must be maintained so that the contractor's expertise, labor and equipment can be utilized to achieve the objectives of the project.

However, the lowest degree of agreement in general aspects is inadequate experience of consultant with the average index is 3.18 and neutral in range index. According to Ng Weng Seng and Aminah Md Yusof, 2006 said that the contractor's design consultants should have a good grasp of build ability fro design development. If designers fail to work within budget and on schedule, poor performance would be expected. Design consultants should understand the construction process and develop a cost-effective.

4.4.2 Problem in Quality Aspect

There are six major problems that contributed to the causes of the problem in Quality Aspect that shows the results of the average index at Table 4.4.

Table 4.4 Problem in Quality Aspect

1 = Not Agree 2 = Less Agree 3 = Neutral 4 = Agree 5 = Strongly Agree

Categories 2 : Problem in Quality Aspect								
No	Problems	1	2	3	4	5	average index	Rank
1	Project done not follow owner's specification	5	15	19	19	4	3.03	5
2	Contractor disregards quality of material in the way to get profit	3	8	22	26	3	3.29	2
3	Ineffective planning and scheduling of project by contractor	5	7	19	29	2	3.26	3

4	Change materials order by owner during construction	2	9	23	21	7	3.35	1
5	Low productivity level of labors	3	12	24	19	4	3.15	4
6	Lack of construction materials and machineries	3	17	26	15	1	2.90	6

From table 4.4, the results show that the highest degree of agreement in quality aspects is change materials order by owner during construction with average index 3.35. The range index shows the respondents neutral with that problem. According to Timothy, et al.,1994) said that owner Using Design & Build no one actually knows the final project price until the project is completed. Using change orders to amend a decision is a time-consuming and expensive undertaking (for example, reintroducing the more expensive, and more efficient, heating system). The design services provider must amend the drawings and specifications, and draft the change order. The contractor must gather supplier and subcontractor information, put the system out to bid and issue its own change orders. Since change orders occur in a competition-free environment, that is, the contractor has already been selected; there is no incentive to make the change at the least possible cost.

However, the lowest degree of agreement in quality aspects is lack of construction materials and machineries. is neutral with average index of 2.9. According to Murali Sambasivan, 2007 said that lack in basic materials like sand, cement, stones, bricks and iron can cause delays in projects. Since Malaysia is a country that is demand exceeds the supply and this causes prices to increase. The contractors postpone the purchase activities until the prices decrease. They also said many of contractors do not own equipments that are required for construction work such as machineries. They rent the equipments when required. During the season when there are many construction projects, the equipments are in short supply and are poorly maintained. This leads to failure of the equipments causing the progress to be hampered.

4.4.3 Problem in Design Aspect

There are six major problems that contributed to the causes of the problem in Design Aspect that shows the results of the average index at Table 4.5.

Table 4.5 Problem in Design Aspect

1 = Not Agree 2 = Less Agree 3 = Neutral 4 = Agree 5 = Strongly Agree

Categories 3: Problems in Design Aspect								
No	Problems	1	2	3	4	5	average index	Rank
1	Contractor takes control of design compare to consultant	2	11	27	16	6	3.21	3
2	Consultant submits construction drawing late.	3	9	24	18	8	3.31	2
3	Contractors always do an additional works compare with consultant	4	9	29	15	5	3.13	4
4	Mistakes and discrepancies in design documents	2	7	25	23	5	3.35	1
5	Owner less involve in controlling design	6	15	18	17	6	3.03	6
6	Insufficient instruction and information in the contract specification, drawing and design	6	6	28	18	4	3.13	5

From table 4.5, the results show that the highest degree of agreement in design aspects is mistakes and discrepancies in design documents with average index 3.35. The range index shows the respondents neutral with that problem. Inadequate planning in design causes mistakes and discrepancies in design documents. They are

common reasons for redoing designs and drawings and may take a long time to make necessary corrections.

However, the lowest degree of agreement in quality aspects is problems is owner less involves in controlling design is neutral with average index of 3.03. This is because the owners not possess any knowledge and experienced of the construction industry. The owner no longer has a direct contract with the lead design professional on the project, that responsibility its is necessarily imputed to the holder of the Design & Build Contract without regard to that entity's specific professional qualification. The intent here is to ensure that the design is completed by a qualified design professional while preserving privities of the Design & Build Contract.

4.4.4 Problem in Financial Aspect

There are six major problems that contributed to the causes of the problem in Financial Aspect that shows the results of the average index at Table 4.6.

Table 4.6 Problem in Financial Aspect

1 = Not Agree 2 = Less Agree 3 = Neutral 4 = Agree 5 = Strongly Agree

<u>Categories 4 : Problems in Financial Aspect</u>								
No	Problems	1	2	3	4	5	average index	Rank
1	Contractor does not having good cash flow or good financial planning	4	5	22	26	5	3.37	2
2	Contractor's submit claims for items not clearly stated in the contract documents	2	11	24	19	6	3.26	4

3	Quantity Surveyor/ Consultant does not estimate work done and material on site correctly	2	11	34	14	1	3.02	6
4	Sometimes progress payment for contractor not in time.	2	10	21	25	4	3.31	3
5	Actual price for project higher than owner's target price	1	8	25	20	8	3.42	1
6	Delay in progress payment by owner to the contractors	1	11	27	18	5	3.24	5

From table 4.6, the results show that the highest degree of agreement in financial aspects is actual price for project higher than owner's target price. It indicated the range in 3.42 of the average index. The range index shows the respondents neutral on that problem. According to (Rosli Abdul Rashid, et al. 2006) said that apart from the fact those very limited contractors are invited to submit tenders, the lack of design and specification detailing during tender, has made the contractors to jack up the price to allow for many uncertainties. This is because once accepted, the tender price will be the final contract sum. It is not subject to change, unless there are variations required or instructed by the client. Such additional cost cannot avoid because under this procurement system the contractor will take much of the financial risk.

However, the lowest degree of agreement in financial aspects is Quantity Surveyor/ Consultant does not estimate work done and material on site correctly is neutral with average index of 3.02. Producing design documents on time by Quantity Surveyor/Consultant is important for completion the project.

4.4.5 Problem in Time Aspect

There are five major problems that contributed to the causes of the problem in Time Aspect that shows the results of the average index at Table 4.7.

Table 4.7 Problem in Time Aspect

1 = Not Agree 2 = Less Agree 3 = Neutral 4 = Agree 5 = Strongly Agree

Categories 5 : Problems in Time Aspect								
No	Problems	1	2	3	4	5	average index	Rank
1	Insufficient time to prepare tender documents	6	14	23	18	1	2.90	3
2	Insufficient time to evaluate tenders	7	15	22	17	1	2.84	4
3	Time is limited to establish if using design and build contract	4	19	29	6	4	2.79	5
4	Project finish not in time as agreement	5	11	24	17	5	3.10	2
5	Delays in commencing work because under-estimated time needed to obtain statutory approvals.	3	11	24	18	6	3.21	1

From table 4.7, the results show that the highest degree of agreement in time aspects is delays in commencing work because under-estimated time needed to obtain statutory approvals. It indicated the range in 3.21 of the average index. The range index shows the respondents neutral that problem. Delay in construction can have a serious effect on field's costs and project time. The contractor must be able to establish the cause of the delay on commencing work because its total impact on individual activities and on the project as a whole.

However, the lowest degree of agreement in financial aspects is time is limited to establish if using design and build contract neutral with average index of 2.79. Design and Build is a quick project because the contractor to be involved in the project at an early stage and proceed with the design works in parallel with the construction activities, the project re-development time could be reduced.

4.5 Analysis of rank the problems and the factors among contractor.

For this question, the respondents should to rank the level of the problems among contractor. The data shown using the table and figure where represented by the rating scale 1 to 5. It is an analysis the level of the problems among contractor using Design & Build method at Klang Valley and was shown in data using frequency analysis. Table 4.8, shows the percentage of rank the problems and the factors among contractors as below:

Table 4.8: Percentage of “rank the problems and the factors among contractors”

No	Problems	Frequency	Percentage
1	<i>Problem In General Aspect</i>	30	48
2	<i>Problem In Quality Aspect</i>	6	10
3	<i>Problem In Design Aspect</i>	16	26
4	<i>Problem In Financial Aspect</i>	8	13
5	<i>Problem In Time Aspect</i>	2	2

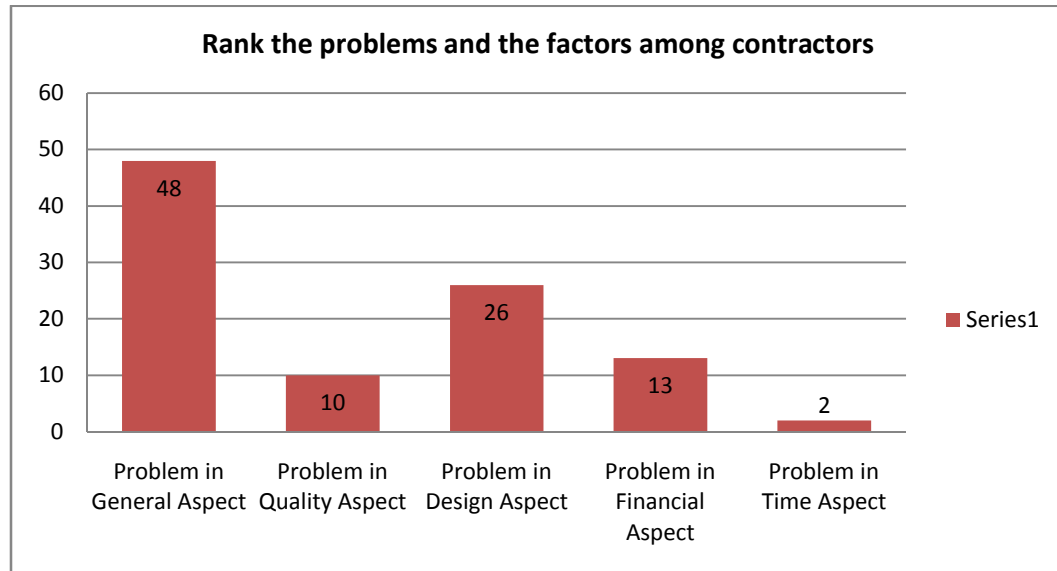


Figure 4.6: rank the problems and the factors among contractors

From figure 4.6 shows, the problems in General Aspect are highest 48% than other problems faced by contractor using Design & Build method. This is because most of the respondents agree problems in General Aspect always happen in construction industry for example problems communication and coordination by contractor with other parties. It is followed by problem in Design Aspect are 26%, problem in Financial Aspect are 13%, problem in Quality Aspect are 10% and 2 % problem in time aspect. Other than that, based on the result obtained from questionnaires were identified the problems among contractor are not critical because overall the respondents are agree with that problem and the average index less than 4.5.

4.6 Summary

From the analysis through questionnaires and interview, it revealed the common problems and the factors faced by the contractor and to rank the problems and the factors among contractors. Based on the result obtained from questionnaire, five of category problems were identified. So from that category will be identify the common problem faced by contractor using design & build are problem in general aspect. It is followed by problem in design aspect, problem in financial aspect, problem in quality aspect and problem in time aspect. Majority of the respondents agree with those problems. Next, the last chapter would discuss the overall study then some conclusion would be made and recommendations would be provided to the construction industries parties

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter consists of two (2) main sections. The first section is the conclusion of the study and the second section is the recommendation. For the conclusion section, this section will conclude the result of the study based on the objectives of this study.

5.2 Conclusion

Based on the overall result, the study has come out with the conclusion based on objectives that have been set up. Those three (3) objectives are on study the comparisons between designs & build contract and conventional contract, to identify the common problems and the factors faced by the contractor and to rank the common problems and the factors among contractors.

5.2.1 Objective 1: Study the comparisons between designs & build contract and conventional contract

The first objective of this research was on study the comparisons between designs & build contract and conventional contract. This objective has been successfully achieved. Design & Build Contract one in which a single entity, usually a contractor assumes responsibility for the design in whole or in part and for the construction and completion of a construction project, main contractor have the right to decide the design of the works follow the concept design and no need to wait for consultant decision. Otherwise for the traditional method owner first hires a design professional, who then prepares a design, including complete contracts documents. The design professional is typically paid a fee that is either a percentage of the estimated construction cost or a lump sum amount, or he or she is reimbursed for costs at an agreed-upon billing rate. With a complete set of documents available, the owner either conducts a competitive bid opening to obtain the lowest price from contractors to do the work or negotiates with a specific contractor. The contractor is then responsible for delivering the completed project in accordance with the dictates of the contract documents.

5.2.2 Objective 2: To identify the common problems and the factors faced by the contractor

The second objective of the study has been successfully identified. Based on the result obtained from questionnaire, five of category problems were identified. There are problem in general aspect, problem in quality aspect, problem in design aspect, problem in financial aspect and problem in time aspect. The problems were then grouped into 5 categories as table in below:

Table 5.1: Categories 1: Problem in General Aspect

	<u>Categories 1: Problem in General Aspect</u>
No	Problems
1	Conflicts between contractor and other parties (consultant and owner)
2	Problems communication and coordination by contractor with other parties
3	Inadequate experience of consultant
4	Lack of staff and labors
5	Changed conditions/differing site conditions

Table 5.2: Categories 2: Problem in Quality Aspect

	<u>Categories 2 : Problem in Quality Aspect</u>
No	Problems
1	Project done not follow owner's specification
2	Contractor disregards quality of material in the way to get profit
3	Ineffective planning and scheduling of project by contractor
4	Change materials order by owner during construction
5	Low productivity level of labors
6	Lack of construction materials and machineries

Table 5.3: Categories 3: Problems in Design Aspect

	<u>Categories 3:Problems in Design Aspect</u>
No	Problems
1	Contractor takes control of design compare to consultant
2	Consultant submits construction drawing late.
3	Contractors always do an additional works compare with consultant
4	Mistakes and discrepancies in design documents
5	Owner less involve in controlling design
6	Insufficient instruction and information in the contract specification, drawing and design

Table 5.4: Categories 4: Problems in Financial Aspect

	<u>Categories 4 : Problems in Financial Aspect</u>
No	Problems
1	Contractor does not having good cash flow or good financial planning
2	Contractor's submit claims for items not clearly stated in the contract documents
3	Quantity Surveyor/ Consultant does not estimate work done and material on site correctly
4	Sometimes progress payment for contractor not in time.
5	Actual price for project higher than owner's target price
6	Delay in progress payment by owner to the contractors

Table 5.5: Categories 5: Problems in Time Aspect

	<u>Categories 5 : Problems in Time Aspect</u>
No	Problems
1	Insufficient time to prepare tender documents
2	Insufficient time to evaluate tenders
3	Time is limited to establish if using design and build contract
4	Project finish not in time as agreement
5	Delays in commencing work because under-estimated time needed to obtain statutory approvals.

5.2.3 Objective 3: To rank the common problems and the factors among contractors

The third objective of this study was to rank the common problems and the factors among contractors has been successfully achieved. Based on the result obtained from questionnaire, five of category problems were identified. So from that category will be identify the main problem faced by contractor using design & build are problem in general aspect. It is followed by problem in design aspect, problem in financial aspect, problem in quality aspect and problem in time aspect. Based on the result obtained from questionnaires were identified the problems among contractor are not critical because overall the respondents are agree with that problem and the average index less than 4.5.

5.3 Recommendation

For overall, this study achieves the purpose, need and objective that have been setup earlier. Nevertheless, there have certain infirmity and weaknesses while doing this study. Thus, the recommendation is provided into 2(two) recommendation to improve the quality and the effectiveness. The recommendations are; recommendation for this study and the recommendation for further studies.

5.3.1 Recommendation for this study

The recommendation to overcome the problems faced by contractor using design and build method

- 1) Effective communication and more coordination between contractor and consultant.
- 2) Owner hired another team such as PMC (private management consultant) to control contractor.
- 3) Main contractor will have the advantage to select their project team and these will ensure smooth delivery of project to enable project to complete in time, less problem and saving cost.

5.3.2 Recommendation for further studies

- 1) Increase the number of respondent and questionnaire for the site study in order to obtain more accurate and precise data.
- 2) Expand the area of the study. The study will be more effective if it is being conducted in the area at Malaysia that has a rapidly prospering development such as the Kuala Lumpur, Penang or Shah Alam for to identify all the problems faced by contractor using design & build method.
- 3) Identify the suitable method use analysis hierarchy process (AHP) for selecting which method suitable with the project.

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